

GENETIC AND MATERNAL EFFECTS ON NEONATAL SURVIVAL IN THE WESTERN LOWLAND GORILLA

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ABSTRACT

Quantitative genetic analyses of primate life history traits provide valuable evolutionary insights with conservation and biomedical relevance. Analyzing the proportion of variation in neonatal survival influenced by genes and maternal identity in the critically endangered Western Lowland Gorilla (*Gorilla gorilla gorilla*) explores potential variables impacting this crucial life history trait. The extended developmental periods, extreme dependence of infants on their mothers, and evolutionary relatedness of gorillas to humans indicate that analyzing neonatal survival in gorillas has applications regarding human life history evolution and biomedical concerns of neonatal mortality. I quantify the proportions of neonatal survival influenced by heritable variation and maternal effects from pedigree and survival data in The International Studbook for the Western Lowland Gorilla using variance component estimation. Markov chain Monte Carlo simulations of generalized linear mixed models provide variance component distributions in the animal model tradition. Two models, one with an additive genetic component and one with both additive genetic and maternal identity components, indicate that neonatal survival is heritable. Also, maternal effects significantly influence the observed variation in this trait. This demonstrates that mothers are essential to the survival of young gorillas, and genes have some influence over whether offspring survive the neonatal period of life.

